

Again, the tables virtually furnish lists of primes to their full extent. We need not remind mathematical readers how often it is important to know, concerning certain results of calculation, whether a number is prime or not, this being the necessary preliminary to further inferences from the processes which give rise to it. As an easy example of the consequence of knowing how a number splits up into prime factors, we may mention the elementary theorem, that any recurring decimal whose period consists of five figures *must* have one or more of the numbers 3, 41, or 271, as factors of its divisor. This is simply a consequence of the numerical identity—

$$99999 = 3 \cdot 3 \cdot 41 \cdot 271.$$

Now, as to relative utility: We are inclined to think that the utility of such tables is measured by the index of the power of 10, to which they extend—that this rule represents the advantage of Vega's table, up to 108,000, over Barlow's, up to 10,000; of Chernac's, up to 1,012,000, over Vega's; and of this set of tables, when completed up to ten millions, over Chernac's. We think this estimate holds for theoretical questions relating to the enumeration and distribution of primes, and cognate questions relating to the theory of numbers, as well as for the practical command they give us over the numbers themselves. Nevertheless, it would not be right to underestimate the important point that this work *does* give us a command over numerical magnitude such as we did not possess before. In that view he would be a bold man who should say that the money cost of the production and printing of these tables was a bad investment for science, especially when the directing labour was gratuitously given. What that directing labour involves can be understood by those alone who have worked upon millions. None others know what an awful factor a million is, when applied to the multiplication of the simplest process. We shall heartily congratulate Mr. Glaisher on the termination of his labours, and we no less heartily congratulate our mathematical friends upon their good fortune in having found such a man to undertake such a task.

We conclude by reminding our mathematical readers that all the processes by which these tables have been formed are but skilful adaptations of the well-known CRIBRUM ERATOSTHENIS, of which the analytical expression was first given by Euler (*introductio in analysin infinitorum*) in his remark that the harmonic series—

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6} + \dots \text{to infinity}$$

is the reciprocal of the continued product—

$$(1 - \frac{1}{2})(1 - \frac{1}{3})(1 - \frac{1}{5})(1 - \frac{1}{7}) \dots,$$

in which the primes only enter.

C. W. M.

WHO ARE THE IRISH?

Who are the Irish? By James Bonwick, F.R.G.S. (London: David Bogue, 1880.)

THIS little work is issued as the first of a series on "Our Nationalities," to be followed by three others on the Scotch, Welsh, and English. It does not appear from the prospectus whether the rest of the series is to be entrusted to Mr. Bonwick; but if they are it is to

be hoped that he will qualify himself for the task by a preliminary study of at least the first principles of ethnology. The present volume, with all its good intentions and praiseworthy industry, must be regarded as a hopeless failure, owing entirely to the neglect of this necessary precaution. For many years ethnology, anthropology, and philology were subjects which any one seemed competent to deal with, who had got hold of a few lists of words in some obscure African or Polynesian dialects (the obscurer the better), or who had desecrated a sufficient number of ancient barrows, or posed to admiring circles under the shadow of some Druid's altar in Cornwall or Brittany. But those halcyon days of the amateur ethnologist are no more, though the writer, unfortunately, seems scarcely alive to the fact. Almost every page of his little tractate betrays solecisms and crudities, such as one naturally looks for in the writings of the Pinkertons, Vallanceys, Vans Kennedys, Bethams, and other obsolete writers of the old Keltic school, but which have become anachronisms since Keltic studies have been placed on a solid basis by the labours of Pritchard, Pictet, Zeuss, Ebel, Lottner, Diefenbach, Whitley Stokes, and Dr. W. K. Sullivan.

A great many authorities are quoted, some, it may be, at first hand, but most of them vicariously, some good, some of no account, some utterly worthless. But all are treated with equal deference, and nowhere is there betrayed the least sense of discrimination as to their respective merits. Thus at p. 27 we have "Betham makes them Teutons, and Wilde, Celts," as if the opinion of a keltomaniac like Sir William Betham could matter a straw one way or the other, and as if in the writer's view it commanded as much weight as that of the distinguished member of the Royal Irish Academy, with whom he is here strangely associated. This vice pervades the entire work, and of itself alone reveals the utter incapacity of the author to deal with such a theme as that of the affinities of the Irish race. Hence it is not perhaps surprising to find ethnical terms treated quite as wildly as ethnological authorities. At p. 19 occurs the following passage, which is quite a curiosity in its way:—"The Basques are believed to be of Turanian origin, while the Celts are Aryans, like most of the Europeans, as well as Persians; Hindoos, &c. Some Turkish and Finnish tribes, with ancient races in Greece, Italy, and Assyria, have been deemed Turanian with Tartar (*sic*) sympathies. The Etruscans of Tuscany were leaning to the Iberian." For wild incoherence and confusion this will surely hold its own with anything to be found in the lucubrations of the most popular exponents of Keltic ethnology in the present or past generation. Frequent use is naturally made of the convenient but dangerous term "Turanian," but its meaning is nowhere defined. Careful writers, if they use it at all, at least restrict it to the Finno-Tataric or Ural-Altaic family. But it is here apparently separated from that connection, so far at least as regards the Tatars, while the Tatars themselves are spoken of as something distinct from the "Turkish" (read *Türki*) tribes, with whom they are nevertheless identical. Why or when "the Etruscans of Tuscany were leaning to the Iberian" we are not informed, nor are we told by whom "the Basques are believed to be of Turanian origin." Meantime it may be well to remind the author

that, though linguistically standing quite apart, the Basques belong ethnically to the same great Mediterranean or Caucasian stock as do the Aryans themselves, and that they can therefore have nothing in common with the "Turaniens." He should also try to realise the fact that Aryan is much more a linguistic than an ethnical term; hence that though there may have been non-Aryan speaking peoples in the British Isles, they need not necessarily have belonged to a different ethnical type from the Aryan-speaking tribes, who afterwards arrived in successive waves of migration, and practically absorbed the previous elements. In a word, apart from the question of quaternary man typified on the Continent by the fossil remains discovered at Canstadt, Cromagnon, Furfooz, Nagy-Sap, and elsewhere, there is nothing to show that in the present geological epoch these islands have been occupied by any races typically distinct from the Mediterranean, least of all that "the primitive Irish were . . . of a kindred more like Finns, Lapps, and Siberians" (p. 9). The Finns have been proved to be comparatively recent arrivals in Eastern Europe, and certainly never have reached the west. Who the "Siberians" are it is impossible to say, for the term is unknown to anthropology as a distinct racial appellation, being in fact a purely political or geographical expression.

A good deal is said about "the dark stock" prevailing in the west and south-west of Ireland. But one of the chief sources of that element is entirely overlooked, probably because too recent and too obvious to arrest the attention of the palæolithic and neolithic ethnologists. The source in question is the Spanish, due to the close commercial and even social intimacy maintained by Spain with the west coast of Ireland down to quite recent times. There were important Spanish trading stations at Dingle, Valentia, Cahirciveen, Bantry, Timoleague, Galway, and elsewhere. Many of the old houses in these places are built in the Spanish style, and it may not be generally known that Valentia Island was actually held by the Spaniards until expelled during the vigorous administration of Cromwell. Many of the peasantry in Kerry and Galway bear an unmistakable Spanish expression, and this factor ought certainly to be taken into account in dealing with the complicated problem of Irish ethnology.

Verbal resemblances are appealed to or at least quoted in the most reckless manner. One instance must suffice: "The *Lettmanni*, or Leathmannice, are said to have given name to the Avene Liff or Liffey; some trace the tribe to *Livonia* of the Baltic" (p. 20). Why to "*Livonia* of the Baltic" any more than to *Livadia* of Greece, or *Livno* of Herzegovina, or *Livorno* of Italy, or *Livuma* of East Africa, or *Livny* of Russia, or *Lippai* of Styria, or *Liffa* of the Moluccas? It is the old story of a river in Macedon and a river at Monmouth, so that "the situation, look you, is both alike," and Fluellen's ethnology quite as good as that of many here appealed to as authorities.

On the subject of the Round Towers the writer has some sensible remarks, and we are glad to see that he has had the courage to reject the Christian theory of their origin. Referring to those overthrown by the earthquake of 448 A.D., he well remarks that "it was very unlikely they had been erected as belfries, since the

churches of the period were *all* of wood, and continued to be of wood for six hundred years after. The oldest stone churches are extremely rude and of imperfect masonry. It is strange, therefore, that the belfries, supposed to have been raised in the twelfth or thirteenth century, when churches were either of wood or clay, or of miserable stone-work, should have a finish and delicacy of work rivalling anything of modern times. . . . If Christian, how is it that only two out of one hundred and twenty-five should bear the least symbol of a Christian character, and while those evidently show such marks to be novel alterations?"

The writer's style and grammar are peculiar. On the very first page we have "lots of discussions;" "we might, it is true, track backward on the track of newcomers;" "we could thus pass by English, Scotch . . . without ever *getting across* the original men." Farther on, "The cup-marks are being still revered," p. 10; "inroading peoples," p. 17. "They brought with them *there* fifty maidens," p. 21. "They reappear on Irish *sods*," p. 23. "The Danes made Dublin, Wexford, Cork, and Waterford the commercial ports they are, whose people are now lighter than the others," p. 59. "Silver was once abundantly ornamenting it, besides precious stones," p. 80. Elsewhere the uncial style of penmanship is spoken of as a "corrupt Latin;" the famous "Book of Kells" is referred to as "the Book of Kelly;" the abolition of clan war-shouts is said to have removed "one cause for shillelahing;" the tendency of the English to become assimilated to the natives is described as "the habit of English to turn Irishy (*sic*) there;" hence the king hesitates "about the expediency of allowing decent Englishmen *mixing up* with Irish," p. 120. There is a good deal of this flippant tone, which cannot fail to give as much offence to the sensitive Irish as the extraordinary grammar certainly will to the sensitive English reader.

A. H. KEANE

OUR BOOK SHELF

Zoology for Students and General Readers. By A. S. Packard, Jun., M.D., Professor of Zoology and Geology in Brown University. With numerous Illustrations. (New York: Henry Holt and Co. London: Trübner and Co., 1879.)

THIS neatly printed and well illustrated volume forms one of the American Science Series, the principal object of which is to supply the lack, in some subjects very great, of authoritative books whose principles are, so far as practicable, illustrated by familiar American facts, while they should at the same time at least not contradict the very latest generalisations of science. Prof. Packard's "Zoology" is one of the first published of the series; it is designed to be used quite as much in the laboratory or with specimens in hand as in the class-room. It is an expansion of a course of lectures for college students, though prepared to meet the wants of the general reader. Most of the anatomical descriptions and drawings have been made expressly for this book, and special portions have had the benefit of being supervised by Professors Hyatt, Gill, Cope, and Dr. E. Coues; the illustrations are to a large extent original, though some of them have appeared before in the pages of the *American Naturalist*, or in Dr. Coues's "Key to the Birds of North America."